

**Supplement
to the
California Public Utilities Commission Staff's
Wholesale Generator Investigation Report
Dated September 17, 2002**

January 30, 2003

Introduction

On September 17, 2002, the California Public Utilities Commission (Commission) staff released a study that concluded that many blackouts and service interruptions during the height of California's energy crisis, November 2000 through May 2001, were avoidable.¹ The Report reached these conclusions by identifying power that was available but not generated, and comparing that amount to the shortages of power that caused blackouts and service interruptions. The Report also identified available power that was neither bid nor otherwise made available to the state's Independent System Operator (ISO) during those hours. Finally, the Report put these conclusions into a larger context by pointing out that an unusually large percentage of the generators' capacity was offline during the blackouts and service interruptions.

The Report is a macro-level overview of available power not generated and not bid, and is based on an analysis of more than 5,000 hours of data provided by the ISO, including 269 hours when the ISO ordered blackouts and/or service interruptions. The data describes, among other things, the operations of scores of generating units owned by the five largest independent generators in California. The study did not attempt to answer the question of why, at each plant and for each hour, the generators did not generate all available power.

The Commission has focused its investigation on the five large wholesale generators, because these companies operated the former fossil-fired utility plants that had been divested as a result of AB 1890. In approving the divestiture of these plants, the Commission required the new owners to operate these plants in a manner that was consistent with the state's need for a reliable electric system. The Commission's role in this regard is set forth in Public Utilities Code § 362, which requires the Commission to ensure that the facilities needed to maintain reliability of electric supply remain available and operational, consistent with maintaining open competition and avoiding an over-

¹ This Report was prepared in connection with the larger Commission staff investigation that was initiated by the Commission's Order Instituting Investigation in I.00-08-002. This investigation was triggered by the sudden increase in retail electricity prices experienced in SDG&E's service territory during the summer of 2000 when SDG&E's ratepayers were no longer subject to a rate freeze and were accordingly exposed directly to volatile, and very high, wholesale prices.

concentration of market power.² The Report shows that the available but unused capacity of the five generators, by itself, could have avoided a significant portion of the blackout and service interruption hours that did occur.

The Commission has received comments on and questions about this Report from the generators, from the ISO and from one member of the California Legislature. We note that the comments from the ISO support many of the conclusions set forth in the Report. The ISO and the Commission staff agree on a number of crucial substantive points, namely:

- Generators did not bid all their capacity into the ISO's markets. This in turn forced the ISO to find and procure resources in "real time" (that is, under pressure at the last minute) in order to serve load.
- Generators did not follow dispatch instructions. Those failures to follow dispatch instructions during system emergencies imperiled the system and the provision of reliable electrical service to the State.
- Generators declined Automatic Dispatch System instructions, citing "economic considerations," conduct which was not reasonable under the circumstances. By Commission staff's count, generators refused in this way to increase power production 311 times (even ignoring dispatches for less than 5 megawatts) because the ISO tried to dispatch many bids multiple times during a particular hour. (Meanwhile, in the same period, generators did not respond to the ISO instructions for 5 megawatts or more of power 1623 times. More than a third of these 1623 instructions were ISO requests for 50 or more megawatts of power.
- The ISO encountered circumstances where generators refused to run, citing lack of operating personnel, or argued with ISO operators over the prices at which they would run. Such conduct was also unreasonable under the circumstances.
- Generators wrongly assert that the ISO had full operational control over the grid through RMR contracts and/or Automatic Generation Control (AGC).

² Public Utilities Code § 362 provides as follows:
362. (a) In proceedings pursuant to Section 455.5, 851, or 854, the commission shall ensure that facilities needed to maintain the reliability of the electric supply remain available and operational, consistent with maintaining open competition and avoiding an overconcentration of market power. In order to determine whether the facility needs to remain available and operational, the commission shall utilize standards that are no less stringent than the Western Systems Coordinating Council and North American Electric Reliability Council standards for planning reserve criteria.
(b) The commission shall require that generation facilities located in the state that have been disposed of in proceedings pursuant to Section 851, are operated by the persons or corporations who own or control them in a manner that ensures their availability to maintain the reliability of the electric supply system.

The ISO and the Commission staff also agree that the only way to determine whether withholding occurred at any particular plant is to look at the evidence hour-by-hour. (We present below some initial results from our hour-by-hour analysis of power plant outages and Commission power plant inspection results.)

By contrast, the comments from the generators appear to be attempts to exculpate those generators from responsibility for the fact that there was available generation capacity that went unused on blackout and service interruption days. To a large extent, the generators' comments attempt to blame the ISO for their failure to generate. Such comments distort the findings set forth in the Report, which did not specifically assign blame for any given blackout. Indeed, the generators have seriously mischaracterized both the substance of the Report and the operating procedures of the ISO. Their comments ignore the fact that California experienced an unprecedented energy crisis during the period studied in the Report and that the behavior of the generators contributed to that crisis, a fact that is confirmed by the ISO.³ Even if there is some validity to the generators' comments about the ISO, it does not resolve our concerns regarding the behavior of the generators. Rather, it means that certain changes should be made to the ISO's tariffs and operating procedures to prevent a recurrence of the system reliability problems we experienced during the energy crisis of 2000-2001.

The Commission has a duty to understand the causes of this crisis, not only to adopt and/or recommend policy solutions to prevent similar crises from happening in the future, but also to attempt to identify any culpable parties so that appropriate sanctions can be imposed.

We understand that the ISO has the responsibility to operate the transmission grid via its tariff and its agreements with participating transmission owners (the public and municipal utilities). However, the generators are wrong about the ability of the ISO to use automated generation control and reliability-must-run contracts to achieve full "operational control" over the entire electric power system. The ISO, in its comments, states that "[a]lthough the ISO can direct a plant to run, in real time the ISO cannot force any plant to run."

However, given that the generators themselves have raised issues concerning the reliability of ISO data and the degree of ISO control over plant dispatch, it is also important, as a matter of sound public policy, for the Commission's continuing investigation into the energy crisis to review all the important factors that contributed to that crisis.⁴ This review will hopefully facilitate the development of an improved approach to grid management that will be able to effectively respond to any future challenges to the reliability of California's electrical system. So far, our continuing

³ Most recently, in its November 15, 2002 submission to Senator Dunn's Committee, the ISO stated that one of the two causes of the blackouts during the winter of 2001 was "the limited supply of energy that was made available to the ISO by suppliers within and outside of the system".

⁴ We note that some of these factors have already been addressed, at least in part, by such actions as FERC's adoption of the "must offer" obligation on June 19, 2001, and by the California Legislature's adoption of SB39XX last year.

investigation has identified a number of concerns relating to the functioning of the ISO system during the crisis. These include:

- The ISO's inability to force power plants to generate during the crisis;⁵
- The absence of sufficient outage coordination and control during the crisis;
- Limitations in certain ISO databases, which hindered the ability of the ISO to manage the grid during the crisis, as well as the ability of investigators to accurately reconstruct what did happen during the crisis; and
- The need for more transparency in, and public access to, data relating to the ISO's operations.

Finally, we must note the difficulty resulting from the fact that the Commission is prohibited from discussing this data publicly in any way without first obtaining a waiver of confidentiality from both the ISO and the generators. For this reason, the Report itself was only able to discuss generator data that the ISO provided in a very general and aggregated fashion. Had the Commission had freer use of this data, the Report would have been much more detailed. Even now, the Commission is prohibited from releasing to the public much of its detailed analysis of what happened during the crisis because of these continuing confidentiality restrictions. Commission staff accordingly believes that all of the data regarding the operations of the generators should at long last be made public. Because so much time has passed since the crisis, there can no longer be any potential damage to the proprietary interests of the generators if this data is made public.

The Report's Conclusions Are Not Changed Significantly by Incorporating CPUC Inspection Reports into the Analysis

Several generators claim the Report is invalid in that it has overestimated available megawatts not generated. In particular, these generators claim that the Commission's plant inspections show that plants were out of service when the ISO database (on which

⁵ We note that the ISO's tariff (and its agreements with generators) granted the ISO the authority to order any generator to produce power (or change its power output) as necessary. (See, ISO Taroff Section 5.6.1, effective October 13, 2000, Original Sheets 180 and 181.) Furthermore, the federal Department of Energy issued a series of emergency orders, effective from December 14, 2000 to February 9, 2001, which required generators and energy traders to provide all available power in response to nightly ISO requests. Because they are *ad hoc* and not systematic, such "command and control" actions are a more cumbersome approach to balancing supply and demand than automated, well-functioning markets in which generators bid in all their power. However, the ISO did not have such a market at its disposal during the crisis. It is therefore important to understand how, faced with unprecedented blackouts, service interruptions, a dysfunctional day-ahead market, and the failure of generators to bid available power, the ISO made use of its emergency authority, both under its own tariff and under DOE orders. It is similarly important to understand any limitations on the ISO's authority to dispatch power during emergency conditions pursuant to reliability-must-run contracts.

the Report is based) showed them as available. Generators also claimed that power plants were unavailable because of the start-up time required after outages.

Commission staff has analyzed the generators' claims regarding the questionable inclusion of various plant outages in the analysis that was presented in the Report. Staff compared the ISO's outage databases used in the preparation of the Report to any Commission staff inspection reports available for these hours and made corresponding adjustments to the Report's estimate of available megawatts not generated. In particular, the staff considered the time necessary to start plants after outages. Where outages appeared to be questionable (see below) no adjustment was made. In some cases, the adjustments result in a decrease in the total of available megawatts not generated, but in other cases the result is an increase in the total of available megawatts not generated. For example, on March 30, 2001, ISO databases show that Unit 5 of AES's Huntington Beach Plant was out of service for the entire day, but Commission staff inspectors that day reported that the plant was "available for full load." Accordingly, the amount of available megawatts not generated increases by 133 megawatts for each service interruption hour during that day.

Staff has accordingly refined its estimates of megawatts not generated based on this new analysis, and has found that the conclusions set forth in the Report withstand most of the generators' criticism about improper use of ISO databases. Based on this refined analysis, Commission staff concludes that during the months from November 2000 through May 2001, California's citizens could have avoided:

- 14 out of 16 blackout hours (88% of the total) in Southern California, down from 16 out of 16 blackout hours (100% of the total) stated in the Report
- 10 out of 23 blackout hours (43% of the total) in Northern California, down from 15 out of 23 blackout hours (65% of the total) stated in the Report
- 161 out of 219 hours of service interruptions (74% of the total) in the South, down from the 177 hours (81% of the total) stated in the Report and
- 116 out of 257 hours of service interruptions (45% of the total) in the North, down from the 131 hours (51% of the total) stated in the Report.

These results reflect the status of our continuing investigation so far. We have revised the figures presented in the Report to reflect our refined analysis. These revised figures, together with revised versions of the tables presented in the Appendices to the Report, are attached to this Supplement.

However, these results are not final, because, contrary to the generators' claims, an inspection report covering one day cannot and does not determine definitively that a

plant's outage was justified.⁶ As the ISO points out in its comments on the Report, such a determination will require the detailed examination of plant maintenance records and possibly the deposition of material witnesses. The Commission staff will conduct such detailed examinations as necessary during the course of its continuing investigation.

➤ **Commission staff continues to identify evidence of suspicious outages**

The Report identified specific examples where plant outages appeared to be suspicious. Our examination of Commission staff inspection reports continues to find more instances of suspicious outages and/or failures, once plants were back on line, to generate all available power; these situations require further investigation. Among our particular concerns are the following circumstances relating to outages observed by Commission staff inspectors:

- A plant appears to suffer multiple failures of the same type within short periods of time;
- A plant shutdown is extended because one or more serious problems are suddenly discovered during a shutdown;
- Plant operators appear not to have taken appropriate care in the timing of testing or in preventive maintenance of equipment; and
- Plants are not used during serious emergencies, possibly because generators did not bid in all their power and/or the ISO did not order the plant to generate.

Specific examples of the types of problematic outages include the following:

- Between November 18 and December 4, 2000, ISO databases show that Units 1 and 2 of Dynegy's El Segundo Power Plant were forced out, and were not producing power. The ISO ordered nearly 1500 megawatts of service interruptions between 4:45 p.m. and roughly 8 p.m. On the next day, December 5, Commission staff began to inspect power plants, and visited El Segundo. The inspector did not report any staffing, safety, or mechanical problems at the plant, noting only that "the units had been shut down, but were now in start-up mode."
- In January 2001, generators claimed in at least two cases that major generation plants broke down for hours or days because an equipment test went wrong.

⁶ The CPUC is now implementing the provisions of SB 39xx, to assure, among other things, that generators keep plants well maintained and available. That program will include audits of maintenance records, analysis of performance statistics, and plant inspections.

In the first case, on January 2, 2001, Unit 5 of AES/William's Alamos Plant stopped generating between 10 and 11 in the morning, and stayed off line for roughly sixteen days. On January 8, plant staff told a Commission staff inspector that the plant operator had inadvertently shut the plant down while conducting a performance test on a boiler feed-water pump for that unit. (Plant staff had performed this test even though the ISO had declared a "no-touch" day, that is, ordered that maintenance operations were to be restricted for that day.) The operator reportedly inadvertently opened the wrong valve and shut off the feed water pump and the unit itself, which was producing 432 megawatts at the time. Plant staff said that once the unit was shut down, they discovered that one of the unit's feed water pumps was "worn out" and there was damage to a super heater valve. The plant was shut down until sometime between 5 and 6 a.m. on January 17 and did not reach full load until 11 a.m. on January 18, 2001. Our on-going investigation will examine (1) whether the claimed test was in fact conducted; (2) whether it should have been conducted in the first place; (3) why it was not conducted at night when demand was low; (4) why problems hadn't been identified and corrected earlier (*e.g.* through vibration or performance changes); and (5) why it took 16 days to return the plant to operation.

- On January 17 (another ISO-declared no-touch day), Unit 4 of Dynegy's Encina power plant went out-of-service at 1:30 pm. That same day, plant staff told a Commission Staff inspector that a technician testing "electronic equipment" caused an electronic relay to trip and put the unit (located in Southern California) out of service that day. According to ISO databases, the plant, which had been generating roughly 250 megawatts, remained out of service until roughly 6 p.m. that evening. Once the plant went back on line, the unit ramped up very slowly to 140 mw (far less than its 303 megawatt capacity) and then slowly lowered its output. The plant was out of service again between 4 and 8 a.m. the next morning. During much of this period, ISO-ordered service interruptions affected customers who were consuming 460 megawatts in Southern California.
- On January 10, 2001, Unit 3 at AES/Williams' Alamos plant went out of service, and remained so until January 20. During this period the ISO ordered roughly 60 hours of service interruptions in Southern California. On January 11, plant staff told a CPUC inspector that two different forced draft fans had shut down simultaneously due to moisture and dirt buildup within the fan motors, closing down the plant. Such motors are protected by housings, as well by heaters and filters to protect the motors from moisture and dirt, respectively. Poor plant maintenance practices may have caused the failure.
- On May 16, 2001, Unit 3 of Reliant's Coolwater power plant went out of service because of malfunctioning turbine bearings. Only ten days later,

on May 26, Unit 4 went out of service for the same reason. Again, poor maintenance practices may have caused the outage.

Our continuing investigation will examine these and other incidents in detail to determine whether the plants were shut down legitimately

The Report Took the ISO's Procedures Into Account in a Proper Manner

➤ Commission staff relied on ISO data in a reasonable manner.

The generators' criticisms of the report are primarily based on the Commission staff's reliance on ISO databases, particularly the SchOut database, which provides detailed information on which generating units are fully or partially out of service. The ISO, in turn, has stated: (1) that its outage data may not be accurate prior to January 1, 2001; (2) that the use of this data should be limited to developing a "higher-level" picture of outages; and (3) that the Commission was warned of this fact, verbally on several occasions, and in writing on two occasions: on April 3, 2001 and in July of 2002.

While it is true that the ISO informed Commission staff that the SchOut database was only good for "higher-level" analysis, that is precisely the manner in which Commission staff used this database. The Report was careful to state that it does not attempt to answer fully the question of why, at each plant and for each hour, the generators did not generate all available power during each service interruption hour. Moreover, the ISO repeatedly told Commission staff that the ISO had a roughly 90% confidence level in its data after 12/1/00, and that the SchOut database was reliable for high-level (that is, aggregated) analysis. We agree with the ISO that this database may not be appropriate for an hour-by-hour analysis of particular plant outages, and our further investigation of generator behavior during the crisis will specifically look at hour-by-hour unit availability based on information in addition to the SchOut database.

Finally, in its comments on the Report, the ISO says that:

The CPUC Staff Report appears to have relied on outage data that are inconsistent with actual market operation. The ISO does not 'assume [] [sic] a plant to be out-of-service for an entire hour even if the plant is only out-of-service for a few minutes that hour.'

This comment is based on a misreading of the Report. In the quoted language, Commission staff was actually referring to the ISO's hourly SchOut database, not to the ISO's operations *per se*, and reflected exactly what the ISO staff told Commission staff about how the SchOut database was put together.⁷

⁷ ISO staff informed Commission staff that the SchOut database is derived from individual "SLIC" outage reports submitted by generators on a unit-by-unit basis as often as necessary. The SchOut

In any case, any inaccuracies in the ISO database do raise important policy questions:

- What outage, bidding, and other databases did the ISO rely upon to make decisions during the crisis? What was the accuracy of these databases?
- What caused any inaccuracies in these databases? To the extent that such errors were due to incomplete, inaccurate, or misleading reports submitted by traders or generators, could these errors have been designed to manipulate the California electricity market?

➤ **Contrary to the claims in certain comments, Reliability Must-Run (RMR) plants are not necessarily available to the ISO.**

Certain of the generators argue that some (or all) of their plants were covered by RMR contracts, and were therefore under the control of the ISO. As the ISO has confirmed in its comments on the Report, this claim is not only misleading but flat-out wrong.

Under the pro forma RMR contract, which served as the basis for all the plant-specific RMR contracts, the ISO can activate a plant only under a limited set of circumstances relating to transmission congestion. Section 4.1 of the contract forbids the ISO from dispatching plants for shortages of “imbalance energy;” that is, for shortages of system capacity of the sort that caused blackouts and service interruptions during the period covered by the report.

➤ **The Report properly accounts for any power scheduled or actually generated at RMR units.**

The Report accounts for all power that was actually generated by RMR units or scheduled into ISO markets. The calculations of power not generated and power not bid in the Report exclude any generation that was supplied pursuant to a routine RMR dispatch order from the ISO, as explained below.

If ISO data shows that an RMR plant did generate, we excluded the power that was generated from the calculation of power that was available but not generated. Regarding the Report’s calculations of power not bid, it should be noted that ISO tariffs require the ISO to decide whether a given RMR plant will be needed a day in advance. If a plant was selected in this manner on any of the days covered by the Report, its generation would have been scheduled into the day-ahead market, and excluded from the calculation of power not bid. Moreover, most RMR plants are free to bid into ancillary services or supplemental energy markets if the ISO does not designate them in advance. Such transactions were also reflected in the Report, and power obtained from an RMR plant

database shows the lowest availability figure for each plant for each hour and is accordingly conservative.

through an out-of-market (OOM) deal was excluded from the power not bid calculation whenever such transactions appear in ISO databases.

Moreover, any real-time ISO orders for RMR plants to dispatch energy were properly accounted for as power generated to the extent to which the plants followed RMR dispatches and other ISO orders. To the extent that the ISO issued real-time orders that plants remain on standby (in order to provide a limited reserve margin), and those orders were not reflected in ISO schedules, the Report does not account for those transactions. However, we are not aware of any transactions of this nature, and we are awaiting clarification from the ISO on this point.

➤ **Many plants, not under AGC control, did in fact fail to follow ISO instructions, and were penalized tens of millions of dollars for those failures under the ISO's FERC tariff.**

The generators' argument that they were subject to dispatch by the ISO ignores a crucial fact: on numerous occasions during the crisis, power plants included in the report either rejected, or failed to respond to, ISO instructions to generate, and the ISO penalized their owners for that failure.

Plants that bid power into supplemental (real-time) energy markets, or that provide reserves other than regulation, receive instructions to generate through a semi-automated system called the Automatic Dispatch System. Under this system, generators submit bids to generate power at a specified price as late as 45 minutes before the operating hour. During the operating hour, the ISO can activate those offers (and dispatch the associated generation) by sending an instruction (usually electronic) to the generator or the affiliated scheduling coordinator. Until December 2000, generators could and did reject these real-time dispatches, even though bids had been submitted no more than an hour or two before. In December 2000, concerned that such rejections were endangering its ability to control the system, the ISO asked FERC for the authority to impose monetary penalties on generators who rejected the dispatches without good cause.

FERC approved the ISO's request, and from December through May (the end of the period covered by this Report), the ISO imposed \$73 million in penalties on the generators for 879 violations, including \$33 million imposed on blackout and service interruption days (for 441 violations).⁸

**Penalties Paid By Scheduling Coordinators
For Failure to Follow ISO Dispatch Instructions
November '00 through May '01
(in dollars)**

Duke	1,678,890.82
Dynegy	13,738,279.98

⁸ According to data received by the CPUC in November of 2002. We understand that some of these assessments are disputed by at least one generator.

Reliant	9, 342,433.13
Mirant	793,000.00
AES	7, 426,466.81

- **The ISO's ability to use emergency orders and/or enter into OOM agreements to obtain power does not relieve the generators of their failure to bid all available power into the market during the crisis.**

Some generators have commented that their failure to bid into the market is insignificant, because the ISO could have issued emergency orders or signed out-of-market deals to get the power needed to serve load. This argument is misleading.

It was publicly known during the crisis that day-ahead markets were providing inadequate amounts of power to the ISO. The ISO also knew that balancing energy markets (including supplemental energy bids) were chronically insufficient. These markets were insufficient, in whole or in part, because generators were not bidding in all available power. The ISO was accordingly constrained to turn to laborious, essentially manual methods -- outside of the market structure envisioned by AB 1890 -- to obtain power, including the issuance of emergency orders and the negotiation under pressure of last-minute out-of-market deals.

The generators' comments on this point overlook the fact that such alternative methods to obtain power are sub-optimal at best. The ISO cannot use its efficient, automated systems to dispatch power under such circumstances. The fact that the ISO was forced to resort to these inefficient alternatives was especially problematic during the Stage Two alerts that prevailed during most of the crisis, when the ISO was trying to avoid having to turn the lights out.

The ISO did not have the authority to order generators to enter OOM deals without issuing emergency orders. While the ISO clearly has the authority to issue emergency orders (and did so a few times), the ISO cannot issue "OOM orders" as such. Rather, it must negotiate OOM orders one-by-one through phone negotiations. As the Report demonstrates, generators sometimes objected to emergency OOM requests (as a result of disagreements on price or claimed technical problems, such as the inability to staff plants during power emergencies). It is accordingly incorrect for the generators to suggest that OOM agreements gave the ISO unfettered access to all available power.

If the generators did actually generate in response to emergency orders, OOM deals or special contracts, the Report accounts for them as having generated. We also counted as power bid into the market all emergency orders that resulted in OOM deals recorded in the ISO's databases.

In some cases, the ISO did enter into OOM deals that obligated generators to provide ancillary services (that is, to keep plants on stand-by as reserves, and to generate power

from the plants when the ISO so ordered). All such contracts were counted as bids into the market and therefore were excluded from the Report's calculation of power not bid. However, to the extent plants were so obligated, and the ISO did not order them to generate during that hour and did not formally document such agreements in their hourly schedules for ancillary service, the Report may have inaccurately included these megawatts held in reserve as power not generated. In our continuing investigation, we have begun to search the ISO's OOM files to determine whether such a theoretical possibility could have affected the Report's results. So far, we have found no such instances affecting the conclusions set forth in the Report.

➤ **The Report properly concentrated on the real-time market.**

Some generators claim that the report ignores bids into the day-ahead and hour-ahead markets. The Report does take account of all bids that were accepted by the ISO and scheduled. As to the day-ahead market, we did not examine rejected bids into the day-ahead market, because that market was, as noted above, severely dysfunctional, and the fact that a bid was rejected simply does not imply that the associated power was not needed.

We also properly did not count rejected bids into the hour-ahead market, for the simple fact that the generators could easily bid rejected power into the supplemental energy market. An hour before any given operating hour, the ISO (and/or the PX, prior to its demise in January 2001) told the generators which of their hour-ahead bids had been accepted. At that point, all generation that had been bid in, but not accepted, should have been available to operate during the upcoming operating hour and could have been bid into the supplemental energy market.

➤ **Further study of the ISO's direct control of power plants is needed.**

Some generators argue that their plants were under the ISO's full control, because the plants were under automatic generation control (AGC), and therefore were responsive to the ISO's dispatch instructions. However, this argument fails if generators are referring to real-time dispatches of reserve capacity or supplemental energy through the Automatic Dispatch System (ADS) discussed above, because the ISO was authorized to send AGC signals only to the extent that the plant had bid its power into the market, and the generator accepted the ISO's subsequent dispatch of that bid. Moreover, the fact that the ISO may have had AGC control over a given plant does not mean that the ISO was authorized to dispatch all the power that plant could produce, and the Report did, in any event, properly account for ADS dispatches, whether through AGC or other methods of communication.

However, plants that were scheduled to provide to the ISO a certain number of megawatts of "regulation" reserve (that is, the right to adjust a plant's output up or down on a second-by-second basis in order to keep the electrical system in equilibrium), did give the ISO full control over those (but only those) megawatts. "Regulation" reserve was not dispatched through the ADS, but rather, directly through AGC, without any

opportunity for the generator to reject the dispatch. In its response to the Report, the ISO states that on May 8, 2001, it had control of generation owned by Duke that had been supplied under a “regulation down” schedule, and that it (the ISO) did turn that generation down while blackouts and service interruptions were in progress. The ISO’s statement appears to support a claim by Duke that the ISO reduced Duke’s generation up to 600 MW during that day. The ISO says that it had good operating reasons to turn generation down that day, but its justification (involving imports and the uncertain impacts of rotating outages) is incomplete. We are unable to quantify the effect of such ISO dispatches of “regulation down” without more specific data, showing which power plants were turned down, when, how long or by how much, on May 8, much less for the entire period covered by the Report.⁹

As part of its continuing investigation, Commission staff will analyze all the data available on the ISO’s control of power plants, hour-by-hour, in order to: (1) identify just what the ISO did with power plants under its control; (2) determine whether plants operated as they were supposed to; and (3) determine the reasons for the ISO’s actions.

The Generators’ Claims That They Had Legitimate Financial Reasons Not to Bid Everything Into Markets Are Not Persuasive

Various generators claim that they had a number of valid, financial reasons not to bid in all available power. By its very nature, this claim confirms one of the key conclusions stated in the Report, namely, that the generators did not bid all available power into the market. Be that as it may, we do not believe that the reasons the generators provide to explain this behavior are persuasive.

First, some argue, the Commission’s rulings bankrupted the utilities, and the California Department of Water Resources (CDWR) delayed providing credit guarantees, so that there was no guarantee of payment. In particular, at least one generator (Reliant) says that for a time, CDWR refused to guarantee payments on ISO markets, thus, in effect, forcing that generator not to bid into those markets.

Second, some argue, bid timing and the need to start up a plant made it impossible to bid all available power. This second argument is basically a statement that generators did not want to start up plants unless they had a commitment from the ISO to buy, even though power supplies were clearly short day after day.

The generators’ actual behavior belies their argument that they did not make their generation available due to their concern over credit risk. The generators did in fact continue to sell into the market as the utilities’ financial condition deteriorated. They also sold to CDWR after it took over the procurement function for the utilities. The fact that not all of their generation was bid into the market contributed to the unprecedented

⁹ More technically, the ISO accepted a bid from Duke for “regulation down,” and then, during the operating hour, sent AGC signals to power plants telling them to reduce generation pursuant to the accepted bids. We have data on what bids generators made and which of those bids the ISO accepted. We have no data on the ISO’s use of those bids during the operating hour.

increases in wholesale energy prices that caused the collapse in the utilities' creditworthiness. It is therefore, at best, disingenuous for the generators to argue now that they did not have an obligation to help keep the lights on because of a credit crisis that their own conduct contributed to.

Moreover, once CDWR took over procurement responsibilities for the State, the generators' concerns about creditworthiness were nearly eliminated, because state law provided that CDWR would recover its costs. After CDWR assumed procurement functions, the fact is that the generators were not actually subject to a high degree of "risk", because there was effectively a guaranteed market for that power. Thus, the generators' argument that they should not have been expected to start up plants that were not scheduled in day-ahead markets does not hold water.

Reliant's response in this latter regard is especially telling. Reliant says that if bids were rejected in day-ahead markets, it generally concluded that power wasn't needed the next day. Based on that conclusion, Reliant did not start its plants, making bidding on short timelines impossible. Reliant's actions under the circumstances were irresponsible and reflect a disregard for the operative conditions of the state's power system at the time. It was public knowledge during the crisis that the day-ahead market was dysfunctional, and was routinely failing to secure adequate amounts of power.¹⁰ Generators should have known that much of their power would be needed, and they should have started plants up, either to bid the power into later markets, or to enter into additional OOM deals with the ISO.

Moreover, if the generators in fact faced any real risks, after early December 2000, they were able to add a risk premium to their bids to assure that they would be able to recoup their legitimate costs. There was accordingly no justification after that date for any of them to fail to bid their available generation into the market.

Other Criticisms of the Report Are of Questionable Validity

➤ Lengthy start-up times do not by themselves justify not generating or not bidding.

As noted above, our refined analysis incorporates the time necessary to start plants up after outages. However, the generators' comments suggest that our analysis requires similar adjustments to accommodate the lengthy start-up after a normal cold shutdown (or "ramp time") required for certain units. We disagree. Plants that require longer periods to start up after a cold shutdown simply must start their units up sufficiently in

¹⁰ Utilities claim that generators started the problem by limiting their bids into the hour-ahead market, or pricing those bids very high. This, utilities claim, drove them to limit the amount of power bought in the day-ahead market, and to make up the difference in the real time market, which was subject to price caps. Generators have their own side of this story. Whoever was right as to the cause of the problem, there is no doubt that the problem existed and that the market was dysfunctional: the "net short" or deficiency in the day-ahead market was sometimes as high as 12,000 MW. (See the ISO's Annual Report for 2001, p.9.)

advance of the time when their power is needed in order to fulfill either their commitments or the public's need for power. The generators knew that the ISO faced large remaining power demands, and the generators could have unilaterally put units with long start up or ramp times on hot standby in anticipation of demand and bid the power into the real time markets so that the ISO could easily and routinely have dispatched this power. The ISO may also bear some responsibility in this regard, because it could have directed that plants with lengthy ramp times be started up sufficiently in advance of the need for the power from those plants to account for such start up requirements.

➤ **The Report does not reach any conclusions about whether plant outages were justified.**

Certain generators have commented that the Report in effect blamed them for having an excessive amount of plant capacity out of service during the crisis. It is certainly true that plant outages did reach unusually high levels during the crisis. This fact deserves further attention and will be the subject of further Commission staff study. However, the Report itself made no judgment and reaches no conclusions about the validity of any of these outages. To the contrary, the Report explicitly accepted the generators' outage claims at face value (to the extent they were reflected in the ISO's data base) when calculating both available megawatts not generated and available megawatts not bid.

➤ **Environmental and other physical and regulatory limitations on plant operation were taken into account in the Report.**

The Report used the ISO database on plant outages. The ISO informed us that when generators reported environmental or other constraints on plant operation, that database showed the plant's affected capacity as out-of service. The Report accordingly excluded that capacity from estimates of power not bid and not generated. As previously noted, we took all claims of plant unavailability due to environmental and other restrictions that were reflected in the ISO database at face value. If a given outage was not listed in the ISO database, but Commission inspectors observed a plant to be out of service, this is reflected in the refined analysis discussed above.

➤ **The generator's argument that their plants operated more during the crisis than before is not relevant; the issue is plant availability.**

Several generators (including Mirant) say that some or all of each generator's plants produced much more power during the crisis than during previous comparable periods. The problem with this argument, however, is that plants operate only when they are both available and needed. When imports or hydroelectric production are high, and most generating units on the system are available, less efficient plants around the state will operate only during peak periods. By contrast, when supplies are very tight (*e.g.*, during the crisis), such plants will be needed to operate at relatively high levels.

Thus, contrary to the generators' contention, the real issue is the availability of plants, that is, whether they were able to generate at full capacity, or alternatively had to operate below capacity or not at all. It is important to remember that during the crisis, total plant outages for the five generators studied in the Report averaged 37% of their total installed generating capacity, and on December 17, 2000, reached as high as 50% of their total installed generating capacity.

➤ **Generator's imports and exports are not relevant to the Report's conclusions.**

Reliant, in particular, argues that the Report ignores Reliant's imports and exports. Reliant's argument is misplaced. Exports of power would simply not affect the conclusions of the Report regarding power not generated or power not bid. If a unit actually generated during a given blackout or service interruption hour, even if the power from that unit was exported, the Report accounted for that generation, and that generation would not show up in our estimates of power not generated. Further, exports had to be scheduled in advance with the ISO, to allow the ISO to make sure that transmission lines to other states had available capacity. The Report counts all scheduled power as bids into the system. Thus, the generators' claims concerning exports are simply irrelevant to the Report.

Nor were imports relevant to the Report's conclusions. The Report concentrated on available but unused generation within the ISO's service area. Importing power does not excuse any failure to produce power at California's power plants during blackout and service interruption hours. Finally, imports may not represent real supply for California. There is evidence that participants in the California market simultaneously imported and exported power in order to manipulate prices and avoid ISO price caps.

➤ **The generator's claims regarding the role of CDWR do not affect the conclusions of the Report.**

At least one generator criticizes the Report's accounting of power not bid, claiming that it offered all its power to CDWR once that agency took primary responsibility for buying the state's power. However, this claim is made without any data or documentation to systematically support it.

It is true that the CDWR did evaluate and enter into deals with generators. If CDWR did turn down power that was offered during blackout and service interruption hours, it is important to find out if it had a good reason to do so. However, we are confident that the Report explicitly counted the power resulting from any such deals with CDWR as power bid into the market, because the ISO's databases reflected such transactions.

➤ **There is no indication that the data on plant capacity used in the Report is significantly inaccurate.**

The ISO and the generators claim that their power plants were either chronically or occasionally unable to generate at full capacity due to age or external factors such as

temperature. We used hourly data on plant availability from the ISO. If this data was in fact incorrect, it may be that the ISO needs to upgrade its procedures for tracking daily and hourly changes in plant availability.

- **There is no evidence that software glitches or computer malfunctions at the ISO significantly affected the conclusions of the Report.**

It appears that the ISO's computer systems failed to work during a few of the hours examined in the Report. However, the generators have not provided evidence that had the Report explicitly considered these failures, it would have made a significant difference in the Report's conclusions. At least one example of this problem presented by a generator is simply invalid. Reliant argues that ISO's incentives made generation uneconomic between 1-2 a.m. on April 2. However, outages did not begin until 9 a.m. that morning, giving Reliant ample time to check with the ISO to see if power would be needed the next morning, instead of leaving its plants in shutdown mode. In any case, as we discuss above in response to the generators' financial arguments, there was no justification for the generators not to bid all available power into the market because of any short-term financial disincentives, particularly under emergency conditions. We will review all of these claimed problems during our continuing investigation.

- **Many of the generators' contentions are vague and unsupported.**

The generators claim that they responded to all ISO requests that were transmitted to them. These claims are vague and unsupported. As noted above, there were instances when generators did not in fact respond to ISO dispatch requests. Moreover, these claims ignore the fact that the generators simply did not bid in all available power during hours when the state was in crisis and therefore beg the question of what the generators could have done on their own to help relieve the serious energy crisis that California faced.

For example, Reliant says that it attempted to respond to any "ISO emergency response," while Duke claims to have provided power reliably "under ISO requests." These vague and unsupported assertions need to be examined hour-by-hour, by examining all communications between generators and the ISO. We intend to do so as part of our ongoing investigation.

- **The Report noted that it did not take account of local transmission constraints.**

Neither the ISO nor the generators have provided evidence that any such local transmission constraints were significant during the period studied. As the Report makes clear, it did take full account of constraints on Path 15, a crucial portion of the transmission link between Northern and Southern California.